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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,495	11/20/2003	Yoshiharu Doi	65933-052	6689

7590 08/22/2007

McDERMOTT, WILL & EMERY
600 13th Street, N.W.
Washington, DC 20005-3096

EXAMINER	
ODOM, CURTIS B	
ART UNIT	**PAPER NUMBER**
2611	
MAIL DATE	**DELIVERY MODE**
08/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/716,495	DOI, YOSHIHARU	
	Examiner	Art Unit	
	Curtis B. Odom	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,9-15 and 17-24* is/are rejected.

7)☒ Claim(s) *8 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 6/4/2007 have been fully considered but they are not persuasive. Regarding the 101 rejection (see page 13 of the Remarks), amended claims 1-24 still do not recite the computer program encoded on a computer readable medium. MPEP 2106.01 [R-5], Section I states the following:

Similarly, computer programs claimed as computer listings per se, i.e., the descriptions or expressions of the programs, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035. Accordingly, it is important to distinguish claims that define descriptive material per se from claims that define statutory inventions.

Regarding claims 3, 4, 11, 12, 19, and 20, the applicant states (see page 16 of the Remarks): **"Kimata et al. (US 2002/0190900) teaches using antenna weights of a finger**

having the largest of SIRs (signal to noise ratios) when path timing of fingers is greatly changed. The antenna weights in this case represent the weighting coefficients occurring after switching. Therefore, in a combination of Yukitomo et al. (U. S. Patent No. 6, 191, 736) and Kimata et al., the antenna weights of Kimata correspond to the second weighting coefficients of Yukitomo et al. Meanwhile, claims 3 and 4 are directed to the weighting coefficients occurring before switching. The claimed subject matter is different from the combination of Yukitomo et al. and Kimata et al. Claims 3 and 4 are neither disclosed nor suggested by Yukitomo et al. and Kimata et al., either individually or in combination."

However, Kimata et al. discloses that the initial antenna weights corresponding to the weights before switching (adaptation) are used to multiply the signals when the path timing is not greatly changed (see section 0038). Kimata et al. further discloses setting a plurality of initial (first) weighting coefficients such that as a result of the multiplications one signal will be multiplied by the initial weights by setting a corresponding weight controller with the initial weights, wherein the one signal corresponding the multiplication has the largest SIR value (see section 0068). Thus, it is the understanding of the Examiner that based on the above disclosure, the Kimata et al. in combination with Yukitomo et al. disclose the limitations of claims 3, 4, 11, 12, 19, and 20 since the weights before switching (adaptation) are also used to multiply the signal.

Regarding claims 6, 14, and 22, the applicant states (see page 17 of the Remarks): **"According to Bottomley et al., updated weighting factors are produced using Least Mean Squares (LMS), starting with an initial set of weighting factors, i.e., by updating the initial set of weighting factors (column 14, lines 10-19). In contrast, claim 6 requires that the**

second weighting coefficients and the third weighting coefficients be derived without updating the first weighting coefficients. Thus, the second weighting coefficients and the third weighting coefficients as claimed are different from the updated weighting factors of Bottomley et al. Accordingly, claim 6 is neither disclosed nor suggested by Yukitomo et al. and Bottomley et al., either individually or in combination. The above discussion is applicable to claims 14 and 22.

Although the claims as recited do not specifically recite the second weighting coefficients and the third weighting coefficients are derived by updating the first weighting coefficients, the claim do not recite that the second weighting coefficients and the third weighting coefficients **cannot** be derived in part by updating the first weighting coefficient. Although the claims do not recite second weighting coefficients and the third weighting coefficients are derived by updating the first weighting coefficients, does not change that Bottomley et al. and Yukitomo et al. in combination disclose all the limitations of claims 6, 14, and 22 as shown below.

Applicant's arguments with respect to claims 1, 2, 5, 7, 9, 10, 13, 15, 17, 18, 21, and 23 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 17-24 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 17-24 recite a computer program without a computer readable medium. MPEP 2106.01 [R-5], Section I states the following:

Similarly, computer programs claimed as computer listings per se, i.e., the descriptions or expressions of the programs, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035. Accordingly, it is important to distinguish claims that define descriptive material per se from claims that define statutory inventions.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, 5, 7, 9, 10, 13, 15, 17, 18, 21, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yukitomo et al. (previously cited in Office Action 1/4/2007) in view of Jayaraman et al. (US 2004/0037354).

Regarding claim 1, Yukitomo et al. discloses a receiver (Fig. 2) including:

an input unit including plural antennas (Fig. 2, elements 101, see column 2, lines 63-67) which inputs a plurality of signals on which a processing is to be performed;

a switching unit (see Fig. 2, block 105, see column 3, lines 13-18) which switches a plurality of weighting coefficients by which the plurality of inputted signals are multiplied (see Fig. 2, elements 107 and 108) between a plurality of first weighting coefficients (see Fig. 2, block 103) to be temporarily utilized and a plurality of second weighting coefficients (see Fig. 2, block 104) which have higher adaptabilities (see Abstract, column 4, lines 22-37 and column 4, line 66-column 5, line 9, wherein the second weighting coefficients are adapted to the rapid changes in channel quality);

a controller (not shown) which instructs the switching unit with a propagation path switching instruction signal (see column 3, lines 13-18) to switch the weighting coefficients between the plurality of first weighting coefficients and the plurality of second weighting coefficients; and

a synthesizer (Fig. 2, block 109, see Abstract and column 3, lines 46-50) which synthesizes results of multiplications, where the multiplications are performed on the plurality of inputted signals and the plurality of weighting coefficients (see Abstract), wherein

the signals input in the input unit are slots/bursts (see Fig. 4).

However, Yukitomo et al. does not disclose the controller requests switching of the plurality of weighting coefficients in the middle of the burst signal. However, Jayaraman et al. discloses receiving bursts/slots (see Fig. 8), wherein a first set of coefficients are retrieved from memory for a pilot (training) section of the slot/burst (see section 0048) and the coefficients are switched to an updated set of coefficients with greater adaptabilities for the data section of the burst/slot (see section 0048). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the device of Yukitomo et al. to allow switching of coefficients in the middle of the burst/slot as taught by Jayaraman et al. since Jayaraman et al. states using the pilot section of the burst/slot for training allows optimum configuration (see section 0053).

Regarding claim 2, Yukitomo et al. discloses a receiver (Fig. 2) including:

an input unit including plural antennas (Fig. 2, elements 101, see column 2, lines 63-67) which inputs a plurality of signals on which a processing is to be performed;

a switching unit (see Fig. 2, block 105, see column 3, lines 13-18) which switches a plurality of weighting coefficients by which the plurality of inputted signals are multiplied (see Fig. 2, elements 107 and 108) from a plurality of first weighting coefficients (see Fig. 2, block 103) to be temporarily utilized to a plurality of second weighting coefficients (see Fig. 2, block 104) which have higher adaptabilities (see Abstract, column 4, lines 22-37 and column 4, line 66-column 5, line 9, wherein the second weighting coefficients are adapted to the rapid changes in channel quality);

a controller (not shown) which instructs the switching unit with a propagation path switching instruction signal (see column 3, lines 13-18) to switch the weighting coefficients from

the plurality of first weighting coefficients to the plurality of second weighting coefficients in prescribed time slot intervals (see column 4, lines 15-45), wherein time slot 300 is multiplied by the first weighting coefficients and time slot 302 is switched to the second weighting coefficients (see column 4, lines 37-45); and

a synthesizer (Fig. 2, block 109, see Abstract and column 3, lines 46-50) which synthesizes results of multiplications, where the multiplications are performed on the plurality of inputted signals and the plurality of weighting coefficients (see Abstract), wherein

the signals input in the input unit are slots/bursts (see Fig. 4).

However, Yukitomo et al. does not disclose the controller requests switching of the plurality of weighting coefficients in the middle of the burst signal. However, Jayaraman et al. discloses receiving bursts/slots (see Fig. 8), wherein a first set of coefficients are retrieved from memory for a pilot (training) section of the slot/burst (see section 0048) and the coefficients are switched to an updated set of coefficients with greater adaptabilities for the data section of the burst/slot (see section 0048). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the device of Yukitomo et al. to allow switching of coefficients in the middle of the burst/slot as taught by Jayaraman et al. since Jayaraman et al. states using the pilot section of the burst/slot for training allows optimum configuration (see section 0053).

Regarding claim 5, Jayaraman et al. discloses the plurality of first weighting coefficients used for training is set by utilizing the plurality of second weighting coefficients used for data in a second iteration (see section 0049), wherein the second coefficients are used in a past multiplication (equalization) as described in section 0048. Therefore, it would have been

obvious to include this feature to allow switching of coefficients in the middle of the burst/slot as taught by Jayaraman et al. since Jayaraman et al. states using the pilot section of the burst/slot for training allows optimum configuration (see section 0053).

Regarding claim 7, Jayaraman et al. discloses the slot/burst signal inputted in a sequential manner as shown in Fig. 8, includes a pilot (training) signal and a data signal, wherein the first set of coefficients are retrieved from memory for a pilot (training) section of the slot/burst (see section 0048) and the coefficients are switched to an updated set of coefficients with greater adaptabilities for the data section of the burst/slot (see section 0048) at the end of the pilot (training) signal. Therefore, it would have been obvious to include this feature to allow switching of coefficients in the middle of the burst/slot as taught by Jayaraman et al. since Jayaraman et al. states using the pilot section of the burst/slot for training allows optimum configuration (see section 0053).

Regarding claim 9, the claim method includes limitations corresponding to the above rejection of claim 1, which is applicable hereto.

Regarding claim 10, the claim method includes limitations corresponding to the above rejection of claim 2, which is applicable hereto.

Regarding claim 13, the claim method includes limitations corresponding to the above rejection of claim 5, which is applicable hereto.

Regarding claim 15, the claim method includes limitations corresponding to the above rejection of claim 7, which is applicable hereto.

Regarding claim 17, the claim includes limitations corresponding to the above rejection of claim 1, wherein claim 1 discloses a method/apparatus that can be executed by a computer, which is applicable hereto.

Regarding claim 18, the claim includes limitations corresponding to the above rejection of claim 2, wherein claim 2 discloses a method/apparatus that can be executed by a computer, which is applicable hereto.

Regarding claim 21, the claim includes limitations corresponding to the above rejection of claim 5, wherein claim 5 discloses a method/apparatus that can be executed by a computer, which is applicable hereto.

Regarding claim 23, the claim includes limitations corresponding to the above rejection of claim 7, wherein claim 7 discloses a method/apparatus that can be executed by a computer, which is applicable hereto.

6. Claims 3, 4, 11, 12, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yukitomo et al. (previously cited in Office Action 1/4/2007) in view of Jayaraman et al. (US 2004/0037354), and in further view of Kimata et al. (previously cited in Office Action 1/4/2007).

Regarding claims 3, 4, 11, 12, 19, and 20, Yukitomo et al. and Jayaraman et al. do not disclose the plurality of first weighting coefficients is set in a manner that, as results of multiplications by the plurality of inputted signals, a multiplication result corresponding to one signal among the plurality of inputted signals becomes effective, wherein the one signal among the plurality of inputted signals is a signal having a largest value among the plurality of inputted signals.

However, Kimata et al. also discloses an adaptive antenna array system including setting a plurality of initial (first) weighting coefficients such that as a result of the multiplications one signal will be multiplied by the initial weights by setting a corresponding weight controller with the initial weights, wherein the one signal corresponding the multiplication has the largest SIR value (see section 0068). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to set the first (initial) weighting coefficients in Yukitomo et al. and Jayaraman et al. as disclosed by Kimata et al. since Kimata et al. states setting the weighting coefficients in this manner obtains directivity with good receiving quality (see section 0069).

7. Claims 6, 14, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yukitomo et al. (previously cited in Office Action 1/4/2007) in view of Jayaraman et al. (US 2004/0037354) and in further view of Bottomley et al. (previously cited in Office Action 1/4/2007).

Regarding claims 6, 14, and 22, Yukitomo et al. discloses a weighting coefficient updating unit (see Fig. 2, block 104) which updates a plurality of third weighting coefficients stored in memory (see column 3, lines 9-13) adaptively based on the plurality of inputted synthesized signals (see column 7, lines 4-22); and a gap (error) compensator which generates the plurality of second weighting coefficients by compensating the plurality of third weighting coefficients in memory (see column 3, lines 9-13) based on an estimated error (see column 7, lines 4-22). Yukitomo et al. and Jayaraman et al. do not disclose a gap (error) estimator which estimates gaps between the plurality of first weighting coefficients and the plurality of third weighting coefficients by performing a correlation processing between at least one of the plurality of inputted signals and a known signal.

However, Bottomley et al. discloses a error (gap) estimator which estimates gaps (error) for a plurality of initial (first) weighting coefficients in order to obtain a plurality of updated (second) weighting coefficients (see column 14, lines 10-19) by performing a correlation (comparison) processing between at least one of the plurality of received signals and a known signal represented by a pilot signal (see column 14, lines 20-36). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to estimate error (gaps) and update the third coefficients to produce updated second coefficients in Yukitomo et al. and Jayaraman et al. as disclosed by Bottomley et al. since Bottomley et al. states these updated weighting coefficients can be used for interference suppression (see column 6, lines 17-21).

Allowable Subject Matter

8. Claims 8 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Curtis Odom
August 19, 2007